THESIS

On

ENURESIS

By

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EPITOME.

The subject of enuresis is considered under three heads.

1. Description.
   Definition of the Term.
   Enuresis may be a symptom of many diseases.
   Enuresis in itself constitutes a disease.

2. Pathology.
   Enuresis is a nervous disease.
   Evidence of this:-
   (a) Association with other nervous diseases. Occurs in neurotic families.
   (b) Exclusion of organic causes and of the urine as a cause.
   (c) Evidence of therapeutics.

3. Treatment.
   Belladonna by far the most useful drug.
   Value of catheterization, counter-irritation, electricity, discipline and other therapeutic measures.

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INTRODUCTION.

In treating cases of incontinence of urine in the Out Patient Department of Birmingham Children's Hospital it occurred to me that the urine, if examined, might yield some indication for the treatment of this disorder - at any rate in some cases. Hyperacidity of the urine is frequently stated to be one of the causes of this condition.

After working at the subject for over twelve months, and examining the urines of 50 different cases of incontinence I have come to the conclusion that it is rarely or never that the urine need have treatment directed specially to it.

Some authorities express the opinion that internal treatment is valueless in this condition. I do not go so far as that. I have taken numerous notes of the progress of cases, and have satisfied myself that one drug at least - Belladonna—is of real service.

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The term Enuresis is derived from the Greek verb ἐνουρέω to make water in (e.g. bed). It is used to describe those cases in which the patient, usually a child, has not proper control over the function of micturition; is not able to retain the contents of the bladder so long as a healthy individual would.

The incontinence of urine generally occurs at night when the patient is asleep, when it is known as enuresis nocturna. It may occur in the day as well as in the night, when it is called enuresis continua. Enuresis which occurs in the day-time only is called enuresis diurna.

The largest group of cases is that in which nocturnal enuresis alone is present, but nocturnal with diurnal enuresis is nearly as common. Diurnal enuresis is exceptional. 70 cases I have treated were grouped thus:- Enuresis nocturna, 39 cases, E. Continua, 30 cases, E. Diurna, 1 case. Many of the 39 cases classified as E. Nocturna had urgency or increased frequency of micturition during the day. Obviously E. Continua is the most severe of the three forms, and may be expected to yield the most intractable cases.

"Wetting the bed" is often due to an organic cause and this should always be looked for. The most common of these causes is phimosis - circumcision cures such cases. But besides phimosis it is well established that redundancy of prepuce, congenital narrowness of the meatus - urinarius, and adhesions between the prepuce and glans penis are causes of enuresis.

There is good evidence also that vesical and urethral calculi, constipation, rectal affections such as piles, prolapse and fistulae, round worms and thread worms, too much drink at night, too much alcoholic drink,and dyspepsia occasionally give rise to this symptom.

To complete the list, lying on the back, exceptional profundity of sleep, gout, rheumatism, masturbation, diabetes, chronic nephritis, being sent to school, laziness, habit, adenoids, excessive acidity of the urine, and alkaline urine, have been instanced as causes of this disorder by various writers, and it is well-known to occur in nocturnal epilepsy.

Lastly it may be due to congential malformation. But a large group remains, probably the largest group of all, in which the symptom constitutes the disease. None of the above causes are present. The

patient may be weak, emaciated and debilitated, or may look the picture of health, or anything between these two extremes. As far as my experience has gone the sickly-looking and healthy-looking children are about equally represented.

The subject has received very little attention from writers of eminence in medicine. Its literature is scanty, probably because it is not, strictly speaking, a serious disorder. Yet it appears to have caused a large amount of trouble not only to patients but also to medical practitioners.

2. One for instance writes thus:- "I suppose every medical man will agree with me when I say there are few diseases the treatment of which gives him greater annoyance, is more unsatisfactory in its results, and consequently brings him less credit."

In the words of [6]. another writer, "Incontinence of urine neither threatens not shortens life, it leads to no special degeneration of tissue, and, beside many of the ills to which flesh it heir its importance is almost dwarfed into a minor misery. But it may well be a question whether, in proportion to its pathological signifance, any other infirmity is productive of so much inconvenience and mental depress-

ion or interferes so gravely with the present comfort and future prospects of its victims. To poor children the habit of wetting the bed must be peculiarly distressing, for not only are frequent changes of linen impossible in their station of life, but the not unnatural irritation of relatives at what they believe to be merely a careless trick, leads not only to a lack of sympathy, but even to positive ill-treatment; and boys in a higher social position being thus rendered quite ineligible for admission to public schools, medical men are naturally very often appealed to for the relief of a disorder, which parents hopefully regard as readily curable." A third writer states the case very forcibly indeed when he [16.] says "I have seen life rendered miserable and the fairest hopes of success completely marred by this unfortunate ailment."

It is clear therefore that this affection which at first sight appears trivial, and indeed is trivial in most cases, does in certain circumstances assume a grave aspect. Unfortunately some cases persist after puberty, although there is a tendency to spontaneous cure at that time of life. Many recover then, which had previously resisted treatment. Of

those persisting some are in patients of decidedly weak intellect and in such cases the prognosis is bad. These patients are usually girls, but I have had no experience of them myself.

Although the great number of cases of enuresis after puberty occur in girls, in children most writers have found the majority of cases to occur in boys. This has not been my experience. Girls have been decidedly in the majority. Out of my 70 cases, all under the age of 12 years, and averaging a fraction over 6 years of age, I had 45 girls and only 25 boys.

Pathology.

All the facts are consistent with, and indeed favourable to the view that the form of enuresis which occurs without any obvious peripheral cause such as those previously enumerated, is a nervous disease. It is a comparatively trivial nervous disease certainly, but it is a near relation of hysteria, chorea, and epilepsy.

I have known 4 patients develop this symptom who had been admitted into Hospital for other diseases. Three of these were cases of chorea. The remaining one was a case convalescent from diphtheria. There is a marked hereditary tendency in enuresis, and it is generally held that the nervous are the most markedly hereditary of all diseases. The mothers of two of my patients have volunteered the information that they suffered from a similar affection in their childhood, and [17.] there has recently been placed on record a remarkable case in which all the children of a family, six in number, suffered from enuresis, having inherited the tendency from their father.

One of my cases was caused by fright, as is common in chorea, two occurred in children of weak

intellect, and two others in epileptics. A third couple had sisters who suffered from attacks of hysteria. One of the two last mentioned was cured in a manner so suggestive of cures sometimes effected in cases of hysteria that it is I think worth recording. He, a boy 8 years old, had been treated for 6 weeks with Belladonna, but had not improved very much. One night his mother gave him a dose of lotion (boracic lotion) by mistake and both she and the patient got a great fright. Salt and water, and mustard and water were given to him and succeeded in making him vomit. He was completely cured by this. At least I saw him three months later and he had only wet his bed on two occasions since he had taken the dose of lotion, although previous to treatment he had wet the bed every night of his life and frequently two or three times in one night. Another important fact in favour of the nervous hypothesis is that the most intractable cases of this affection occur in girls, as previously stated.

7. Farquharson has pointed out the association of enuresis with chorea, and with eczema, and [13]. Herman, referring to enuresis, has recently written, "It often runs in families, several members of the

same family being affected with it. It is sometimes inherited,and a tendency to other nervous diseases, such as migraine, epilepsy, insanity, hysteria, &c., will often be found to run in the family." The same authority points out that there is a close analogy between enuresis and spermatorrhoea, as do also 1. Clifford Allbutt, 14. Jacobi, and 10. Goodhart. In the latter condition of course there is usually no organic cause. It also must rank as a nervous disease.

Seeing that the disease sometimes occurs in debilitated children many writers have ascribed it to be due to weakness of the sphincter vesicae. This view is hardly worth serious consideration. I quote the following from Landois and Stirling's 15. Text-book of Physiology "As long as there is a moderate amount of urine in the bladder, the elasticity of the elastic fibres surrounding the urethra and that of the sphincter of the urethra suffices to retain the urine in the bladder. This is shown by the fact that the urine does not escape from the bladder after after death." The amount of urine in the bladder when enuresis occurs nevers exceeds the limits of moderation, and is indeed very often small. Quite

a large proportion of my patients have wetted the bed habitually within an hour of falling asleep, in spite of having emptied the bladder shortly before falling asleep. It is interesting to read at the end of the section from which I have taken the above quotation "Enuresis nocturna or involuntary emptying of the bladder at night may be due to an increased reflex excitability of the wall of the bladder, or weakness of the sphincter." This statement is probably copied from some authority, but it is obviously inconsistent with the other one. There is sound argument tooin the remark of [12]; Henoch, who says "In children who are otherwise healthy, it seems somewhat forced to assume the presence of atony limited to the sphincter vesicae."

Another hypothesis which is frequently advanced without an atom of evidence in support of it is "irritability of the detrusor." This phrase does not mean anything in particular as far as I can see. The detrusor vesicae can have no irritability at all apart from the nervous system. This assignment of the site of the disorder to the muscular structures of the bladder has certainly no support from therapeutics for nearly all observers are agreed that the drug - ergot - which acts specially on unstriped

muscle has no specific action in enuresis, and the same may be said of digitalis and strychnine. I have found strychnine by itself quite useless in enuresis, and have even known a case develop it while the drug was being taken, namely, the convalescent from diphtheria previously alluded to.

Theoretically it appeared quite reasonable to suppose that enuresis was due to some abnormality in the urine. The majority of writers on the subject lay stress on the importance of reducing the abnormally high acidity of the urine which according to their statements is usually, or at any rate frequently met with in this condition. It is to this phase of the subject that I have specially directed my attention. After examining the urine of 50 cases of enuresis I have come to the conclusion that the enuresis was not due to the condition of the urine in a single instance. I cannot of course absolutely state that enuresis is never dependent upon the condition of the urine, but I am satisfied that it rarely does so, and that cases in which it did would belong to a different category from those commonly met with.

Certainly one frequently finds a deposit of urates in the urine of cases of enuresis. But it is

also very commonly met with in children who appear to be in ordinary health. It is quite easy to make the urine free from the deposit. I have done so in numerous cases, but without any effect on the incontinence, or at any rate without curing it. The deposit appears to depend on slight gastric disturbance, and probably a regulation of the diet alone would remove it in a longer or shorter time.

In the following tables I give the details of the examination of the urines of 50 cases of enuresis. For comparison I give corresponding details of the examination of urines of 50 children who did not suffer from enuresis. The latter were taken haphazard from the Wards, and were the urines of children as near good health as could be got in Hospital. None of these contained any abnormal deposit or constituent. Of the urines of the 50 enuresis cases 2 contained albumin (in both, this subsequently disappeared) but sugar did not occur in any of them. 7 contained a deposit of urates, and 1 a deposit of phosphates. In 2 cases the urine was neutral and in one case it was faintly alkaline when passed. (At a subsequent examination the urine of this case was acid, but the enuresis persisted).

It will be seen that the average acidity of the urine in the enuresis cases is actually smaller rather than in excess of that of the 'healthy' cases. The mean acidity in the two groups shows a larger number of cases with a high degree of acidity in children who are not suffering from enuresis than in those who are.

I do not attach much importance to these differences. I infer rather that enuresis is not dependent upon the condition of the urine.

In the case of patients in Hospital I have frequently noticed increased frequency of micturition with urgency, and relapses of nycturia more frequently associated with a lower degree of acidity than the patient's average, rather than with a higher. When benefit results from the administration of alkalies - and it really does appear to do so - I think the benefit is largely if not entirely due to the improvement in digestion which is effected.

ACIDITY OF THE URINE IN 50 CASES OF ENURESIS.

(An acidity of e.g. 5 means that 5 c c's of decinormal soda solution have been required to neutralize 10 c c's of urine).

Initials. of Patient.	Acidity. Of Urine.	Initials of Patient.	Acidity. of Urine.
M. S.	3.0	H. B.	2.6
D. J.	2.8	L. J.	1.0
V. S.	7.0 (Urates)	G. G.	3.3
C. H.	2.5	M. B.	3.8
B. H.	1.0	S. S.	4.3
E. R.	Faintly Alkaline.	M. D.	2.2
		E. S.	2.0
E. J.	4.5	S. G.	2.8
W. P.	8.0	W. L.	6.8
H. T.	4.5.	B. E.	1.5
B. P.	3.5.(albumin)	B. F.	4.0
F. W.	1.5.	W. W.	3.7
A. C.	2.5.	L. P.	3.2
G. R.	Neutral.	A. G.	4.8
F. H.	6.0	H. S.	1.7
C. W.	8.5	M. D.	3.0
A. L.	1.0	T. C.	3.0
E. A.	1.0	L. E.	3.0
L. B.	2.3	H. L.	2.9
H. H.	4.0 (urates)	A. L.	1.6
J. E.	4.2 (urates)	A. C.	Neutral.
E. S.	1.0 (albumin)	H. H.	7.2 (urates)
W. D.	6.0	F. J.	7.0 (urates)
E. C.	5.0	A. C.	1.7
F. H.	4.4	M. C.	10.4 (urates)
B. N.	4.2 (urates)		

Average Acidity = 3.5

Acidity of the urine in 50 children who did not suffer from enuresis.

Initials of Patient.	Acidity of Urine.	Initials of Patient.	Acidity of Urine.
J. C.	2.3	A. W.	2.0
G. F.	2.9	H. M.	6.5
A. R.	3.5	A. G.	3.5
B. G.	0.7	R. C.	6.0
P. F.	1.3	H. P.	1.8
O. P.	0.2	N. H.	3.0
L. W.	2.5	L. W.	4.0
J. B.	7.0	J. S.	1.5
F. R.	6.4	R. C.	5.4
E. T.	6.0	M. B.	3.7
A. R.	4.5	A. D.	7.4
A. D.	6.0	E. C.	10.1
R. C.	7.1	F. F.	1.5
L. B.	8.9	G. R.	3.0
J. B.	3.2	E. J.	2.1
N. W.	4.8	G. K.	7.0
W. M.	8.4	W. W.	5.0
N. H.	4.1	O. P.	1.5
B. D.	9.1	H. R.	4.0
W. H.	11.9	J. P.	7.3
N. W.	2.3	V. L.	8.0
H. H.	5.0	K. T.	2.3
F. H.	7.3	E. E.	8.8
A. H.	5.0	H. R.	4.1
L. H.	3.5	O. R.	3.1

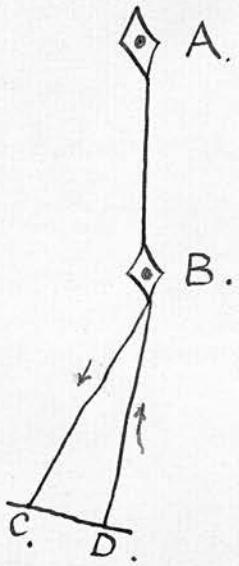
Average Acidity = 4.7

Mean acidity of the urine in enuresis.

Acidity =	10 or over	1 cases.
"	9 "	0 "
"	8 "	2 "
"	7 "	3 "
"	6 "	3 "
"	5 "	1 "
"	4 "	9 "
"	3 "	9 "
"	2 "	9 "
"	1 "	10 "
"	below 1 "	3 "
		50 cases.

Mean acidity of the urine in health.

Acidity =	10 or over	2 cases.
"	9 "	1 "
"	8 "	4 "
"	7 "	6 "
"	6 "	5 "
"	5 "	4 "
"	4 "	6 "
"	3 "	8 "
"	2 "	7 "
"	1 "	5 "
"	below 1 "	2 "
		50 cases.



Let A. represent the cerebral centre presiding over micturition and B. the micturition centre in the lumbar enlargement of the spinal cord. CD can represent the mucous membrane of the urinary bladder, which is connected with the lumbar centre by efferent and afferent nerves. The symptom of enuresis might occur from a fault in A or B or in the nerve fibre AB, or in the reflex arc BCD.

In the infant up to the age of 12 or 18 months incontinence of urine is a normal condition. The influence of A is absent or incomplete. The bladder distends until a stimulus is sent to the lumbar centre, the result being the expulsion of the contents of the organ. This occurs at practically regular intervals as the bladder becomes full. The

reflex arc BCD is mainly concerned in the process. The infant resembles the dog with its spinal cord divided above the lumbar enlargement, as in the well-known experiment by [9]·Goltz, and instances of injury to the lower dorsal portion of the cord in the human subject have frequently been observed to result in a similar condition[4]· namely, of reflex micturition at regular intervals.

But this condition is not in the least like enuresis. The latter has no definite relation to fulness of the bladder as has been previously pointed out, and usually there is a considerable amount of irregularity in its manifestations. It does not occur with preponderating frequency in the first years of life either, as it naturally would do if it were a persistence of the condition proper to early infancy. Out of the 70 patients under my own care 30 had suffered all their lives from enuresis, and we cannot argue anything from these. But of the 40 cases in which micturition was normal for several months or years, enuresis began in 18 children under 5 years of age, and in 22 children over 5 years of age.

We are led therefore to locate the pathological condition underlying enuresis to the reflex arc BCD

This localization appears to be consistent with all the facts. The patient is, so to speak, at the mercy of his reflex arc. It is too sensitive. His cerebral centre may not be able to control it at all- enuresis continua; or the patient may suffer from undue urgency in the day-time, although not from positive incontinence, in which case the control of A is not complete. In the mildest phase of this disorder the instability of the reflex arc is not manifested until the influence of A is withdrawn - enuresis nocturna.

What part of the reflex arc is defective? To this question no definite answer can be given. We might have expected some clue from the effects of therapeutic measures. But we do not know, for instance, how the bromides act in epilepsy. Neither do we know how belladonna - the second best drug - acts in epilepsy. Nor do we know how the latter acts in enuresis. It is conceivable that it reduces the excitability of B - similar to its supposed action in epilepsy. On the evidence we have, the pathology of enuresis does appear most likely to be over-excitability of the lumbar centre. But then belladonna may act in BD by its power of paralysng the peripheral terminations of sensory nerves.

To summarize, if we have excluded organic causes, as well as obvious peripheral irritation such as vesical calculus, and also the urine, we are compelled to localize the pathology in the nervous system. I have shown its analogy to and its occurrence with other functional nervous diseases and the possibility of its being due to over excitability of the micturition-centre in the lumbar enlargement of the spinal cord.

TREATMENT.

1. Drugs.

So far as my experience has gone there is only one drug that we can prescribe with confidence in this condition, and that is belladonna. This opinion is frequently expressed by other writers but it is far from being universally held. For instance, one authority[5]. writes "I have so signally failed to produce any probably good effect with belladonna that I am constrained in the face of most authority to the contrary to pronounce at least against its frequent usefulness. I have never known improvement from it in cases with otherwise unaltered conditions, nor on the other hand in those to whose previously careful but unsuccessful treatment it formed the sole addition." That it fails to cure some cases one must admit, but the results I obtained myself with it were gratifying. Out of 49 cases to which I administered this remedy 12 were completely and speedily cured (3 of these had previously suffered all their lives) 29 were more or less improved, and in only 8 cases was there no favourable effect produced. So that improvement occurred in 41 out of 49 cases.

These figures would probably compare very favourably with most remedies in other diseases.

I tried strychnine alone in two cases. It failed to effect any improvement in either. This would naturally be the result if the pathology of the condition is as I have suggested.

I tried digitalis alone in two cases. Bother were unrelieved.

Bromide of potassium alone was given to three patients who suffered also from slight epileptic fits. The enuresis was unaltered in one; improved in the second, and was cured in the third case.

Iron, arsenic and Cod Liver Oil were given together in six cases. One recovered, three improved and two were unrelieved.

Iodide of iron has been strongly recommended by one writer.[2]. I tried it alone in 5 cases. One got well while taking it, one improved, and 3 were unrelieved.

I have given alkalies alone - either bicarbonate of potash or bicarbonate of soda, in 9 cases. Three improved, but none recovered completely.

Two cases in which I used cod liver oil only got well. One case which had bronchitis also, was

treated with a mixture containing ipecacuanha, and the bronchitis and the enuresis got well together. In my opinion, such cases merely illustrate the principle that all disorders tend to cure through any agency which improves the general health. There is the psychical effect of treatment also to be taken into account. It will be seen however, that among drugs, Belladonna has in my hands been by far the most serviceable.

In the exceptional cases where the urine is alkaline it might be as well to try the effect of treatment calculated to make it acid. Benzoic acid is usually recommended but salicylate of soda answers very well. But as I previously stated my own case was not cured by the urine being made acid. Cantharides, zinc, camphor, and ergot have their advocates. I have had no personal experience of these remedies and the accounts I have read of their supposed usefulness have not been convincing to me. The fact of a patient occasionally getting well while taking a drug does not prove anything.

Lately, Rhus Aromatica has been vaunted as a remedy in enuresis. [8.] It is claimed that it is equally efficacious as Belladonna and has the advantage of being safer. The latter argument does not

appeal to me. I have used Belladonna in 40 minim doses of the new B. P. tincture - nearly equal to a drachm and a half of the old tincture - without alarming effects. One child could not sleep on the night after the first dose, but subsequently she was all right. None of the others had symptoms more disagreeable than paralysis of accommodation and dryness of the mouth and throat. The remedy is as safe as most powerful remedies are.

Some writers recommend a single large dose at bed-time for enuresis nocturna. I have had better results by giving the drug three times a day. Most of these cases have increased frequency of micturition in the day-time.

Catheterization is a useful method of treatment. Most writers recommend a large-sized metal instrument. I effected a cure in Hospital in one case - a boy 6 years old - by means of the soft rubber catheter. That form was preferred because it could be used by the nurse. It was passed until the urine was drawn off, and left in the urethra for 10 minutes every night and morning. Ten days treatment effected a cure. This is the only case in which I have tried this method.

Counter-irritation in the form of a blister applied over the sacrum is recommended in obstinate cases. I have had no personal experience of it, but think it is a rational mode of treatment.

Massage with a finger in the rectum has been recommended recently by Alfons Hanc [11]. He considers internal treatment is useless and treats his cases by catheterization, counter-irritation, and the form of massage (Thure-Brandt massage) just alluded to. I have had no experience of it myself.

Electricity has numerous advocates. I have used it in one case - Faradic current - and some improvement occurred.

I think the effect of the above remedies is largely if not entirely due to the impression they produce upon the mind - as is I believe the usually accepted view of the influence of electricity in hysteria. This is the opinion of [12]. Henoch who injected ergot into the perineum for enuresis with marked success, and later on was equally successful with distilled water. He says "a few smart strokes on the nates immediately after the injection considerably enhanced the effect of treatment."

In cases of exceptional obstinacy the application of a strong solution of nitrate of silver to the

prostatic urethra has been known to do good. But this remedy could only be satisfactorily employed by experts.

Sir Dominic Corrigan's plan of sealing up the meatus urinarius every night with a plug of collodion seems a perfectly harmless method,and one quite likely to do good. It does not appear to be widely used however, and I have not tried it myself. It is claimed that a fortnight's treatment suffices to cure the majority of cases.

Another plan [18.] which may assist a cure is to raise the foot of the patient's bed so that the urine tends to press more towards the fundus of the bladder than in the horizontal position.

Perineal trusses and ligatures round the penis are condemned by nearly all writers, and I concur in that view. They generally do more harm than good.

Discipline.

This includes micturition by the patient just before going to bed, and being wakened for micturition at intervals during the night. The latter is very troublesome and almost impracticable in private practice. It is strongly recommended by some writers.[5.]

I have tried it in one case in Hospital without effecting a cure. Young children too, strongly resent being roused, and not infrequently scream with fright and refuse to micturate. Yet within half an hour or an hour of being put back in bed they pass urine involuntarily. This has happened with several of my Out-Patients according to the mothers statements. With older children it might answer better, and with a child anxious to cure himself. I should think an alarm-clock would be a first-rate thing.

It is doubtless advantageous to instruct the patient to retain his urine as long as possible during the day, and to restrict the amount of fluid imbibed by him towards bed-time. A hard mattress is to be preferred. "Castigation" in the words of one writer[2.] "is a method of treatment only to be mentioned to be condemned." I concur in this view.

If we accept the view that enuresis is a nervous disease we are likely to be less disheartened at finding some of our cases very intractable. Unfortunately some of them exhibit a tendency to relapse again and again after apparent cure. Goodhart [10.] classifies enuresis and chorea as the two diseases which are likely to trouble the practitioner most and

yet bring him the least credit. I quite agree with him.

To summarize the subject of treatment, I would say:- Examine all the systems of the body and exclude obvious organic causes such as phimosis. It is not unlikely, for instance, that gastric catarrh may be present..which, if cured, would allow the neuresis to cure itself. Indeed a probably explanation of the hyper-acidity theory lies here. The usual remedies for gastric catarrh in children contain a little alkali.

After the obvious morbid conditions have been put right, I am satisfied that the drug most likely to prove serviceable is Belladonna. It will be as well at the same time to instruct the mother to see that the bladder is emptied on the child's going to bed, and that if possible he is induced to micturate on being wakened later on. Mamy children micturate very soon after falling asleep - within 2 hours. It will be well to find out the child's usual time and anticipate it by half an hour or so. As I said before some recommend a single large dose of Belladonna at bed-time for nycturia. This may do in some cases but I have had better results by giving the remedy three

times a day. Start say with 15 minim doses three times a day for a child of 4 or 5 and increase up to 40 minim doses, if required, watching the effect. Out of 49 children to whom I have given such doses not one has had delirium. All have had dilated pupils and several complained of dryness of the mouth and throat. One child could not sleep on the night after the first dose although she slept all night on subsequent nights. As previously stated, Belladonna in my hands effected distinct improvement in 41 out of 49 cases. The majority of these cases had been suffering from enuresis for upwards of 12 months and a large number of them had suffered all their lives. It is encouraging if only a single dry night occurs during the first week of treatment because it shows that the habit can be broken. The slightest improvement that can be noticed is when a child who actually has wet his bed every night is reported to be not so wet as he was. This is commonly reported by the mothers. On further enquiry one finds that they know that the child wakes up in the morning with a fuller bladder than he used to do - he is not drier because he has secreted less urine. According to Lander Brunton,[3]. Belladonna sometimes slightly increases the secretion of urine.

If there is no improvement in the course of a fortnight, I do not think it is of any use to persevere with Belladonna. For male children, I should try catheterization in the manner previously described or Corrigan's Method of sealing up the meatus urinarius at night with collodion. For male or female children, electricity might be employed and I think a strong interrupted current is most likely to prove successful - one electrode, say, in the lower dorsal region and the other in the perinaeum or above the pubic symphysis.

Children undergoing treatment should not be allowed to attend school, at any rate, if the case proves difficult to cure. Indeed after apparent cure a month or two should elapse before they return to school as I have known the symptoms to reappear immediately after a child resumed school in more than one case.

In cases which resist all treatment, particularly in those associated with mental deficiency, where cure is practically hopeless, obviously the best treatment is for the patient to wear an india-rubber urinal. But the percentage of cases in which one would be reduced to this is certainly very small.

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